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Our letter of October 20, 2000

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Claims

1. Process for the hydrogenation of a sulfur containing feedstock, having a sulfur content of less than 50 ppm, wherein the feedstock is hydrogenated in the presence of a precious metal catalyst, the precious metal being selected from platinum, palladium, rhodium, ruthenium, iridium, osmium and alloys thereof, such as platinum-palladium, and a nickel-catalyst, said process being carried out in such a manner, that the feedstock is contacted initially with the precious metal catalyst followed by contact with a metal oxide and the nickel catalyst, either in combination or sequentially, and wherein the metal oxide has been selected from the oxides of silver, lanthanum, antimony, bismuth, cadmium, lead, tin, vanadium, calcium, strontium, barium, cobalt, copper, tungsten, zinc, molybdenum, manganese and iron.
2. Process for the hydrogenation of a sulfur containing feedstock, having a sulfur content of less than 50 ppm, wherein the feedstock is hydrogenated in the presence of a precious metal catalyst, the precious metal being selected from platinum, palladium, rhodium, ruthenium, iridium, osmium and alloys thereof, such as platinum-palladium, and a nickel-catalyst, said process comprising contacting the feedstock with a mixture of precious metal catalyst, metal oxide and nickel catalyst, the previous metal catalyst being a supported precious metal catalyst and the nickel catalyst being Raney nickel or a supported nickel catalyst, and wherein the metal oxide has been selected from the oxides of silver, lanthanum, antimony, bismuth, cadmium, lead, tin, vanadium, calcium, strontium, barium, cobalt, copper, tungsten, zinc, molybdenum, manganese and iron.

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3. Process for the hydrogenation of a sulfur containing feedstock, having a sulfur content of less than 50 ppm, wherein the feedstock is hydrogenated in the presence of a precious metal catalyst, the precious metal being selected from platinum, palladium, rhodium, ruthenium, iridium, osmium and alloys thereof, such as platinum-palladium, and a nickel-catalyst, said process comprising contacting the feedstock first with a mixture of precious metal catalyst and metal oxide, followed by contact with the nickel catalyst, and wherein the metal oxide has been selected from the oxides of silver, lanthanum, antimony, bismuth, cadmium, lead, tin, vanadium, calcium, strontium, barium, cobalt, copper, tungsten, zinc, molybdenum, manganese and iron.

4. Process according to claim 1, wherein the sulfur content of the feedstock is less than 10 ppm.

5. Process according to claim 1, wherein the feedstock, after hydrogenation with the precious metal catalyst and before the hydrogenation with the nickel catalyst is contacted with the metal oxide.

6. Process according to claim 1, wherein the feedstock is simultaneously contacted with the metal oxide and the nickel catalyst.

7. Process according to ~~claims 1 or 3-6~~ ^{CLAIM 1}, wherein the precious metal catalyst is a supported catalyst.

8. Process according to claim 1, wherein the support of the precious metal catalyst is selected from silica, alumina, silica-alumina, titania, zirconia, zeolites, carbon, clay materials and combinations thereof.

9. Process according to ~~claims 1-8~~ ^{CLAIM 1}, wherein the precious metal content of the catalyst is between 0.01 and 5.0 wt.%, calculated on the weight of the catalyst.

10. Process according to ~~claims 1-9~~ ^{CLAIM 1}, wherein the nickel catalyst is Raney nickel or a supported nickel catalyst containing from 0.5 to 99 wt.% nickel.

11. Process according to ~~claims 1-10~~ ^{CLAIM 1}, wherein the amount of precious metal catalyst ranges from 1 to 30 vol. % of the total system.

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A 12. Process according to ~~claims 1-11~~ ^{CLAIM 1}, wherein the weight ratio of nickel catalyst to metal oxide is between 20:1 and 1:20.

A 13. Process according to ~~claims 1-12~~ ^{CLAIM 1}, wherein the feedstock is selected from petroleum distillates, resins and solvents.

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